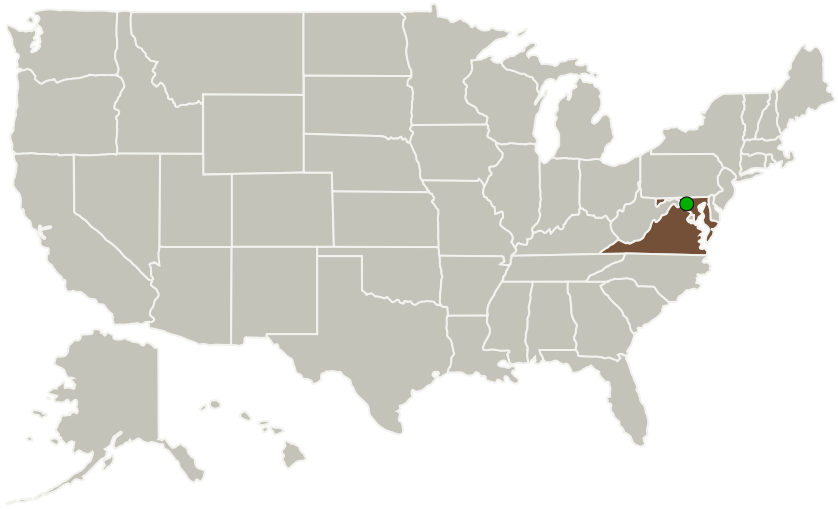
A Dropsonde UAV for Atmospheric Sensing in a Turbulent Environment, Phase I

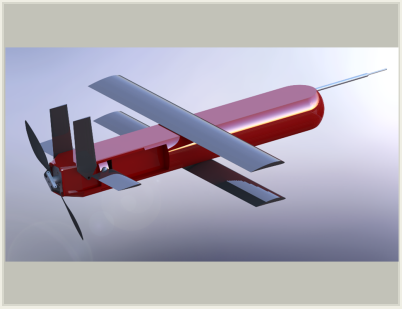
Completed Technology Project (2014 - 2014)

Project Introduction

Dropsondes are one of the primary atmospheric measurement tools available to researchers. Current dropsondes are deployed with a free fall parachute trajectory, allowing no flight path control and requiring the deployment aircraft to fly close to the target. Adding an extended, guided range capability to the dropsonde will allow much greater mission flexibility by providing significant geographic and temporal coverage of areas of interest. Barron Associates, Inc. will accomplish this through an innovative winged dropsonde that launches from a regular dropsonde launch tube, and deploys wing and tail control surfaces, and a propeller, starts the engine, and executes the mission under horizontal, powered flight. The Phase I vehicle will focus on avionics and sensor integration, vehicle prototyping and flight testing of a long-endurance version of the vehicle. The vehicle will be equipped with a pressure, temperature and humidity sensor and a wind sensor which is extended out the front of the vehicle to allow accurate measurement. The vehicle will also be equipped with gas sensors, a custom autopilot board and a long-range telemetry system. High-turbulence operation is highly desirable and a portion of the Phase I effort will go towards researching the vehicle configuration and software enhancements necessary to support operations in a highly turbulent environment. The end result of the Phase I will be a flight tested, long-endurance, guided dropsonde vehicle, and a feasible Phase II plan for enhancing the vehicle to support high-turbulent operations, allowing use for hurricane, volcanic plume, and wildfire atmospheric science.

Primary U.S. Work Locations and Key Partners





A Dropsonde UAV for Atmospheric Sensing in a Turbulent Environment Project Image

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Barron Associates, Inc.	Lead Organization	Industry	Charlottesville, Virginia
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

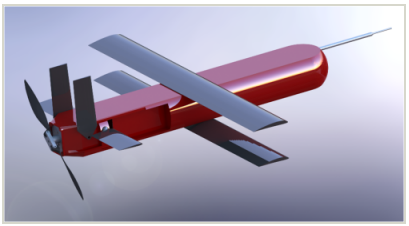
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137711)*

Images



Project Image
A Dropsonde UAV for Atmospheric Sensing in a Turbulent Environment Project Image
(https://techport.nasa.gov/image/131995)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Barron Associates, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

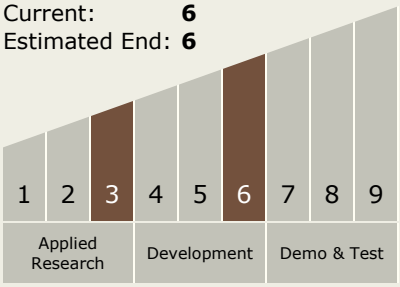
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Richard Adams

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System